

## US CLAIMS:

1. A device for balancing the pressures of first and second fluids contained respectively within first and second circuits or receptacles, wherein the device  
5 comprises:

first and second valves respectively comprising first and second valve bodies respectively defining first and second chambers communicating via first and second admission orifices respectively with the first and second 10 circuits or receptacles respectively containing the first and second fluids, and communicating via respective exhaust orifices with respective exhaust means for the first and second fluids, at least one first valve member and at least one second valve member mounted to move 15 respectively in the first and second chambers along an axial actuation direction between a position for closing and a position for opening the exhaust orifices of the first and second chambers respectively, a first piston and a second piston each constituted by a rigid plate 20 secured respectively to the first or to the second valve member, and a flexible metal wall of a bellows secured in leaktight manner to the rigid plate of the respective piston and to an element of the first and the second 25 valve bodies respectively, so as to constitute a closed chamber having a wall that is deformable in the actuation direction, and first and second resilient return means for returning the first and second valve members respectively into the closed position; and

wherein the first closed chamber of the first piston 30 of the first valve is in communication with the chamber of the second valve, and the closed chamber of the second piston of the second valve is in communication with the chamber of the first valve.

35 2. A device according to claim 1, wherein the body of the first valve and the body of the second valve are interconnected and in axial alignment along a common

actuation direction of the first and second valves so as to constitute a body of the balancer device, the chamber of the first valve and the chamber of the second valve being separated from each other by a wall extending  
5 transversely relative to the actuation direction of the body of the balancer device, said wall having fixed thereon, on a first side inside the chamber of the first valve, the metal wall of the bellows of the first piston, and on a second side along the actuation direction inside  
10 the chamber of the second valve, the metal wall of the bellows of the second piston, the separation wall of the body of the balancer device having passing therethrough a first channel for putting the first closed chamber of the first piston into communication with the chamber of the  
15 second valve, and a second channel putting the closed chamber of the second piston into communication with the chamber of the first valve.

3. A balancer device according to claim 1, wherein the  
20 body of the first valve and the body of the second valve are built up of two assembled-together portions respectively defining a first portion of the valve chamber in which the admission opening and the exhaust opening are provided, and a second portion in which there  
25 are disposed the first and second pistons respectively, the first and second portions of the chambers of the first and second valves being separated by respective walls of the body of the valve having respective openings formed therethrough on the axial actuation direction and  
30 in which there are disposed respective guide bearings for the corresponding valve members, each of which comprises a rod mounted on the axial actuation direction with one axial end secured to the corresponding piston and with the opposite end, inside the first portion of the valve  
35 chamber, carrying a shutter member.

4. A balancer device according to claim 1, wherein the first valve member of the first valve and the second valve member of the second valve include respective shutter assemblies for shutting the exhaust openings,  
5 each of said assemblies including a pilot valve shutter member secured to one end of a rod of the valve member and a main shutter member having a surface for bearing against a seat of the exhaust opening and a central cavity in which the shutter member of the pilot valve is  
10 engaged with freedom to move along the direction of the actuation axis of the valve, the pilot valve shutter member communicating with the outside of the main valve via a channel that the pilot valve shutter member is capable of closing.
- 15 5. A device according to claim 1, wherein the first and second resilient return means of the first and second valve members are constituted by helical springs interposed between respective thrust surfaces of the  
20 first and second valve members and thrust surfaces of a valve body corresponding to the balancer device.
- 25 6. A device according to claim 5, wherein the helical spring has at least one of its ends thrusting against a thrust plate of position that is adjustable along the actuation direction of the valve of the balancer device.
- 30 7. The use of a balancer device according to claim 1, for adjusting the pressures of two fluids to values that are substantially equal in respective feed circuits for first and second heat exchanger portions of a heat exchanger.
- 35 8. A use according to claim 7, wherein the heat exchanger is a plate heat exchanger.
9. A use according to claim 7, wherein the first heat exchanger circuit is for receiving a secondary heat

exchange gas containing nitrogen in an installation for producing electricity by using a high temperature nuclear reactor, and the second heat exchange circuit is the primary circuit of the high temperature nuclear reactor 5 cooled by a gas such as helium.

## A B S T R A C T

The device comprises a first valve and a second valve each comprising a chamber communicating via an admission orifice with a circuit or a receptacle containing a first or a second fluid, and via an exhaust orifice with exhaust means for the first or the second fluid, at least one valve member mounted to move within the valve chamber between a position for closing and a position for opening the exhaust orifice, a piston connected to the valve member and resilient return means for returning the valve member to a closed position. Each of the first and second pistons has a first face exposed to one of the first and second fluids, and an opposite second face subjected to a force exerted respectively by the second fluid or by the first fluid.